

Remarks

Claims 1-6 and 9 are pending, all of which have been rejected. Claims 1 and 3-6 are amended herein to improve readability.

Drawings

The Examiner objected to the drawings for allegedly lacking descriptive textual labels. Office Action, paragraph 2. Applicant submits herein Replacement Drawing Sheets 1-5, which include additional labels and legends for Figs. 3a-e. Annotated Sheets 1-5 showing the changes are also attached herewith. The corresponding text in the Specification (page 6, line 14 – page 9, line 9) is also amended to more clearly describe the contents outlined in these figures. The objection to the drawings is thus obviated.

Specification

The Examiner stated that the application does not include an abstract. Office Action, paragraph 4. Applicant wishes to direct the Examiner's attention to page 17 of the application as filed, where an abstract of the disclosure was included. Applicant herein submits the abstract again and respectfully requests that the abstract be entered. The abstract is being amended herein to correct a typographical error.

Additionally, as discussed above, amendments to the Specification, page 6, line 14 – page 9, line 9, are submitted herein to incorporate numerical references to the drawings for better readability.

Applicant requests that the objection to the specification be withdrawn.

Claim Objection

Claims 1 and 3-6 are objected to because the Examiner considered “-” and “’s” as special characters that cannot be used in the claims. Applicant has amended claims herein to remove some perceived informalities. For example, “OS’s” is removed and “de-fragmenting” is changed to “defragmenting.” Certain terms, such as “re-swap” and

“re-map” are left unchanged because they clearly recite elements of Applicant’s invention and are consistent with the established usage of prefixes. The use of “re-swap” and “re-map” is also fully supported in the specification.

Applicant accordingly requests that this objection be withdrawn.

Claim Rejection: Obviousness

Claims 1-6 and 9 have been rejected under 35 U.S.C. § 103 as being obvious and thus unpatentable over U.S. Patent No. 5,778,392 (“*Stockman*” hereafter) in view of U.S. Patent No. 5,761,680 (“*Cohen*” hereafter). The rejection is respectfully traversed.

Stockman classifies storage space into tile and vacancy areas; the former contains data whereas the latter does not. *Stockman*, column 5, line 42 – column 6, line 21. A method for opportunistically moving tiles and filling vacancies is disclosed which, *Stockman* asserts, reduces the number of nonessential moves—compared to the prior art methods—for a file to be pushed from its original location to its final goal location. *Stockman*, column 4, lines 48-67. *Stockman* discloses a goal tile map that defines the target positions of tiles. Loaded into the system memory together with a tile-reorganizing program, the goal tile map guides the tile movements such that, in most instances, no more than one move is needed for a tile to reach its goal position from its original position. *Stockman*, column 12, lines 25-64; column 6, lines 62-65.

Cohen teaches a defragmentation utility that allows coherent file access during defragmentation in a preemptively multitasked multithreaded operating system. *Cohen*, column 2, lines 30-64. A disk alias driver is disclosed, which works with a defragmenter routine, to trap accesses to a file and maintains coherent access to the file while the file system structures are updated as a result of defragmentation performed by the defragmenter routine. *Cohen*, column 2, line 67 – column 3, line 6.

Applicant’s claims are directed to methods and apparatus of tracking original file storage locations by recording, during defragmentation, swapped locations instead of original contents stored at the swapped locations in a historic buffer. Applicant’s

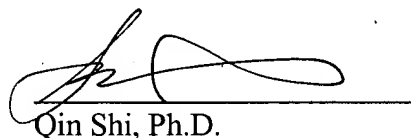
methods and apparatus alleviate fast consumption of the historic buffer during defragmentation and allow restoration of the pre-fragmentation state when necessary.

Stockman and *Cohen* each solves an entirely different problem from Applicant's invention. *Stockman* improves efficiency of moving a collective set of data on a storage device from their original positions to the target positions. *Cohen* manages file access by a multithreaded multitasked operating system during defragmentation to enable coherent file access. *Stockman* and *Cohen* are simply not concerned with the problem that defragmentation tends to render restoration impossible because history data is pushed out of the history buffer by a large number of rewrites generated during defragmentation. Neither *Stockman* nor *Cohen*, alone or in combination, discloses or suggests defragmentation by swapping operations, or recording of swapped page allocations instead of the original contents of altered pages. Therefore, the Examiner's art, singularly or combined, cannot render obvious applicant's claims.

Withdrawal of the obviousness rejection is respectfully requested.

Applicant believes that this application is now in condition for allowance of all claims herein, claims 1-6 and 9. A Notice of Allowance is respectfully requested. The Examiner is invited to contact the undersigned if further discussion should advance prosecution.

Respectfully submitted,

A handwritten signature in black ink, appearing to be 'Qin Shi', written over a horizontal line.

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Page#1	Page#2	Page#3	Page#4	Page#5	Page#6	Page#7	Page#..
File C	File C	File B	File B	File B	File C	---	---

Figure 1

Page#1	Page#2	Page#3	Page#4	Page#5	Page#6	Page#7..	Page#..
File C	File C	File C	File B	File B	File B	---	---

Figure 2

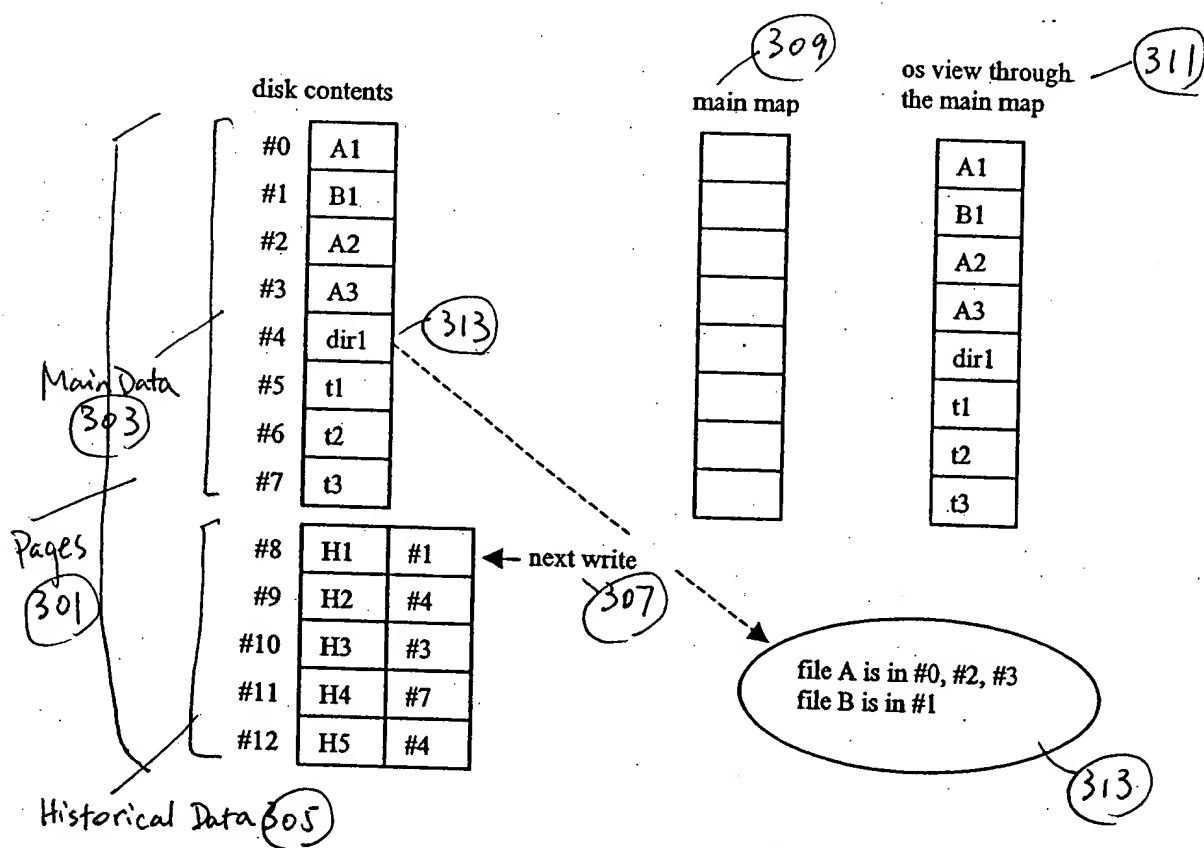
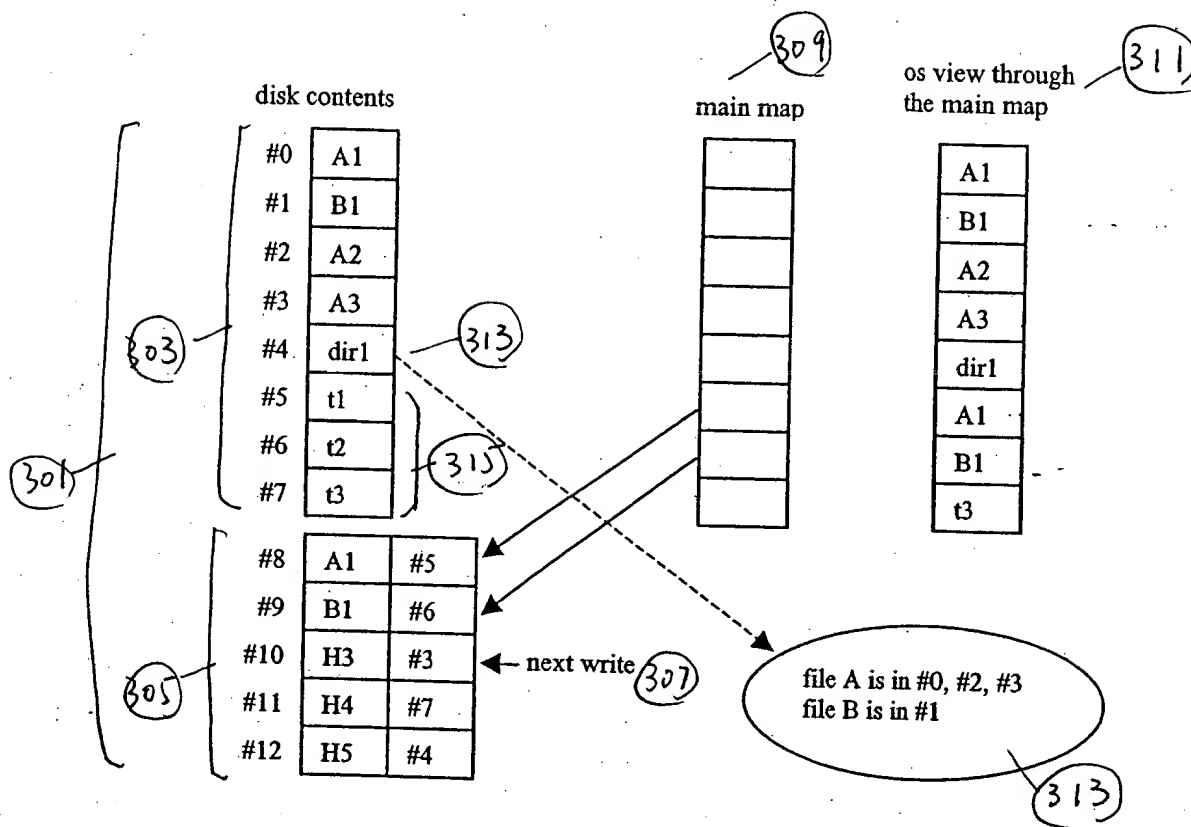


Figure 3a

Element labels 301, 303, 305, 307, 309,
311, and 313 added.



Element Labels 301, 303, 305, 307, 309, 311, 313, and 315 added.

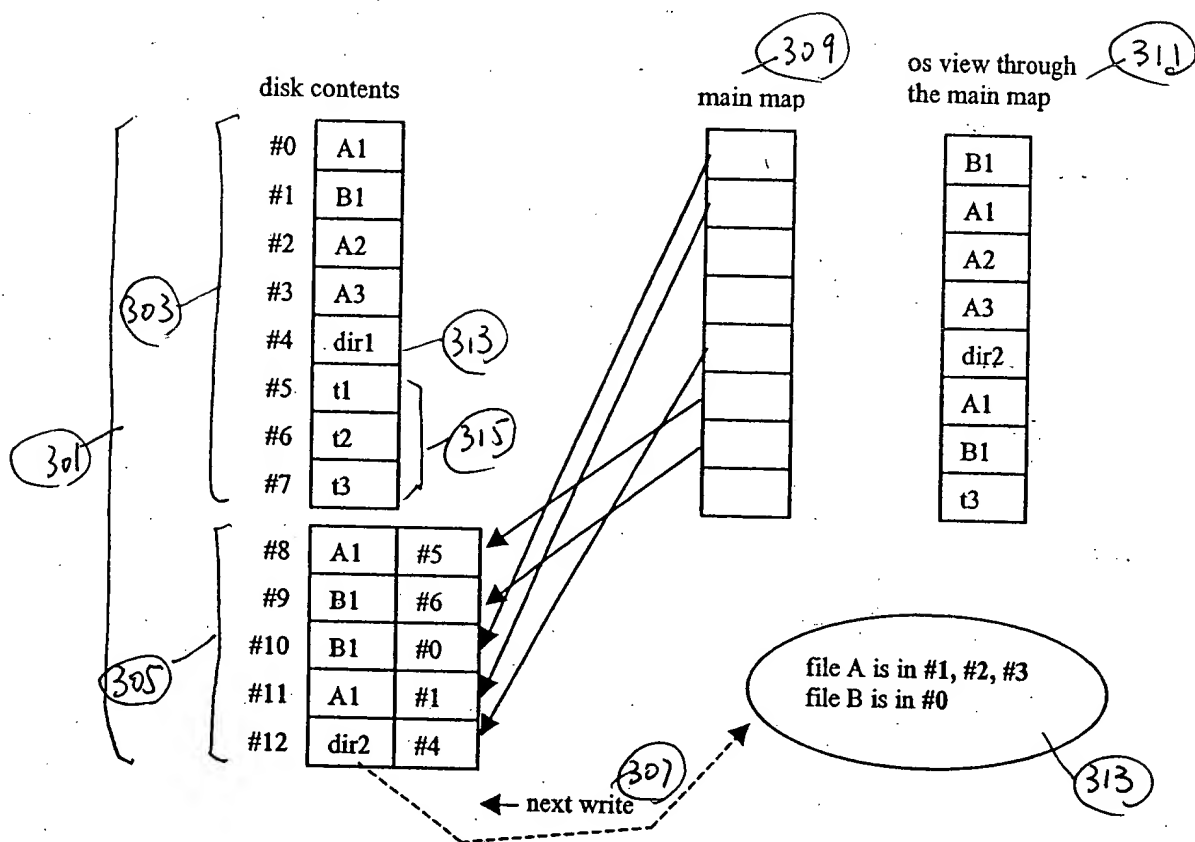


Figure 3c

Element Labels 301, 303, 305, 307, 309, 311, 313, and 315 added.

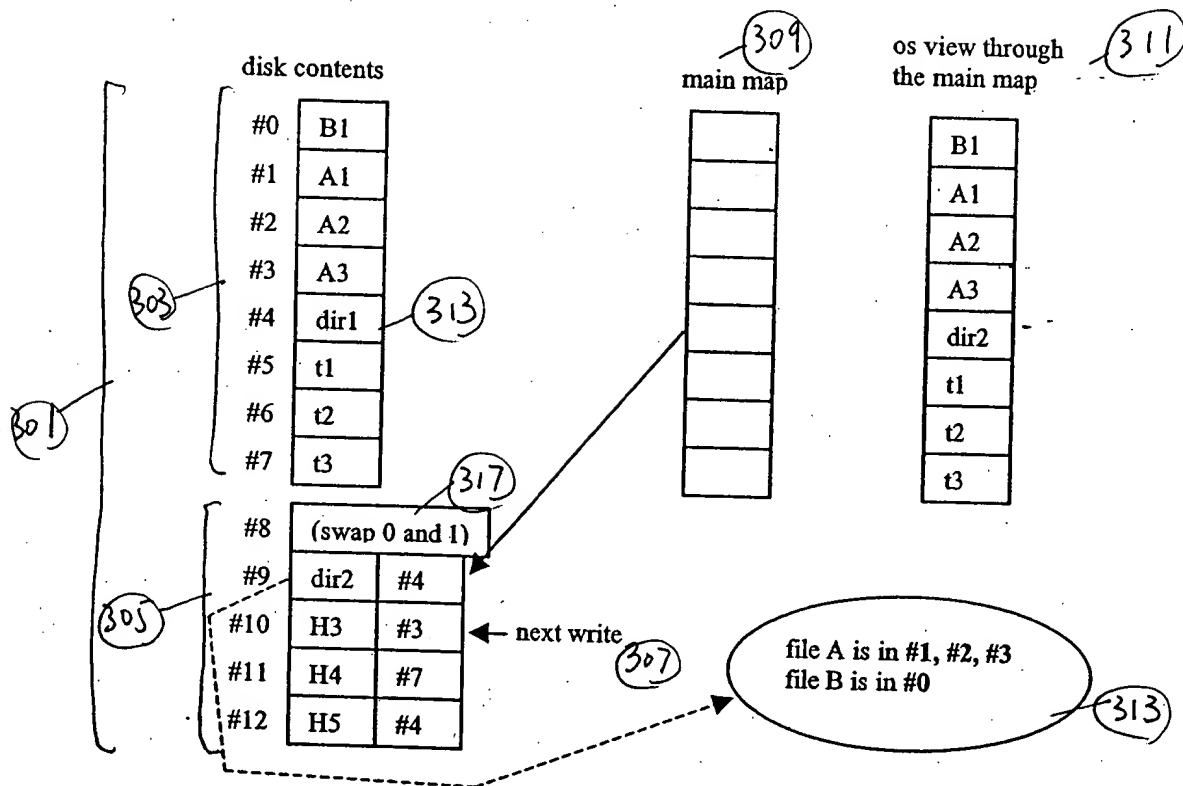


Figure 3d

Element labels 301, 303, 305, 307, 309, 311, 313, 315, and 317 added.

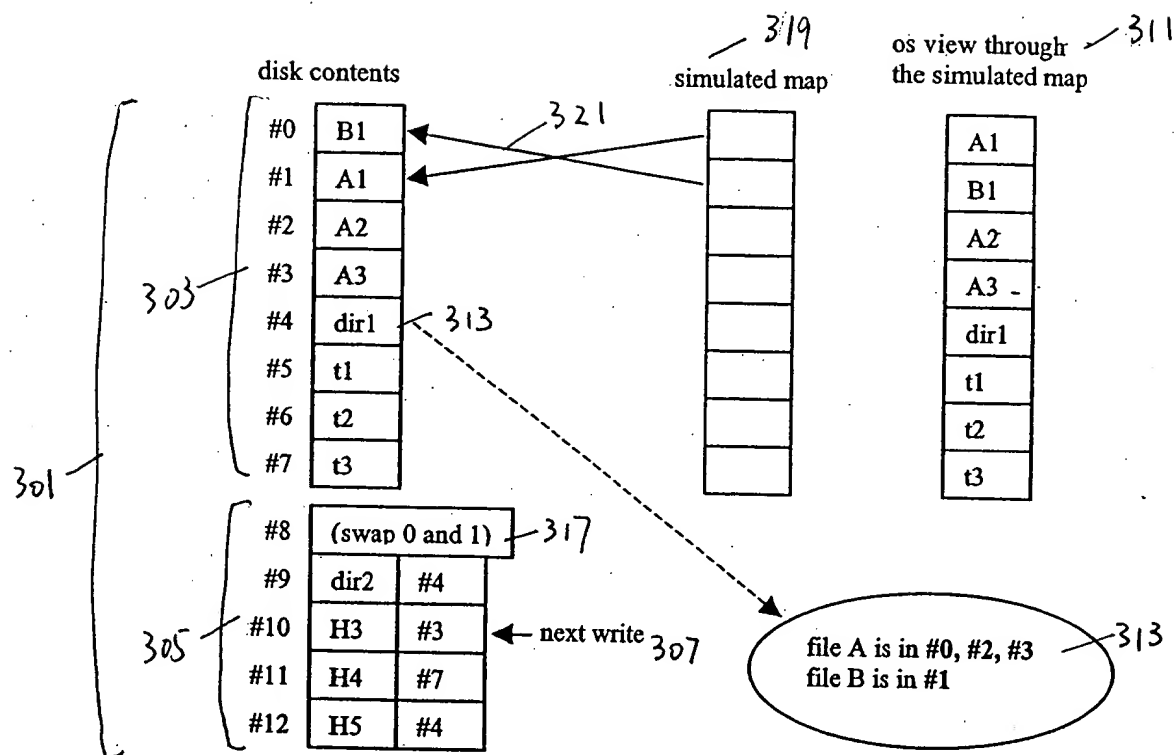


Figure 3e

Element labels 301, 303, 305, 307, 309, 311, 313, 315,
317, 319, and 321 added.